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ABSTRACT OF THE DISCLOSURE

5 Refrigeration process for gas liquefaction which utilizes one or more vaporizing
refrigerant cycles to provide refrigeration below about -40°C and a gas expander cycle to
provide refrigeration below about -100°C. Each of these two types of refrigerant
systems is utilized in an optimum temperature range which maximizes the efficiency of
the particular system. A significant fraction of the total refrigeration power required to
10 liquefy the feed gas (typically more than 5% and often more than 10% of the total) can
be consumed by the vaporizing refrigerant cycles. The invention can be implemented in
the design of a new liquefaction plant or can be utilized as a retrofit or expansion of an
existing plant by adding gas expander refrigeration circuit to the existing plant
refrigeration system.

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